

## CLAIMS

What is claimed is:

**1.** A network comprising:

a plurality of computers each having an address, for generating data packets, and each including an interface with a data output and a broadcast input;

a plurality of data channels respectively connected to the data outputs of the computers for receiving data packets from the computers;

a broadcast channel connected to the broadcast input of the computers; and

a hub including a plurality of ports respectively connected to the data channels and a broadcast output connected to the broadcast channel;

the hub for merging data packets received at the ports into a stream of data packets and for providing the stream of data packets to the broadcast channel; and

the hub for providing to the broadcast channel connected to one of the computers data packets addressed to the one computer.

**2.** A method for communicating data in a network including file servers and a chain of workstations with a first workstation and a last workstation, the method comprising:

sequentially routing data issued by a workstation through the last workstation;

broadcasting data sequentially routed through the last workstation to the file servers;

generating the same data by each of the file servers; and

broadcasting the generated data on separate broadcast channels to the workstations.

**3.** A method for communicating data in a network including workstations and file servers, the workstations being connected in a chain and having a first workstation and a last workstation, the method comprising:

sequentially routing data issued by a workstation through the last workstation;

broadcasting data sequentially routed through the last workstation to the file servers; and

broadcasting data issued by the file servers to the workstations on respective broadcast channels.

4. A method for communicating data in a network including local area networks (LANs) and a remote source, each LAN including workstations connected in a chain with a first workstation and a last workstation, the method comprising:

sequentially routing data issued by a workstation through the last workstation;

broadcasting data sequentially routed through the last workstation to the workstations on a broadcast channel;

transmitting data generated at the remote source to the LANs; and

broadcasting data transmitted from the remote source to the workstations on a broadcast channel separate from the broadcast channel carrying the sequentially routed data.

5. A network comprising:

a plurality of computers each having an address, for generating data packets, and including:

a packet assembly input for receiving data packets from another computer;

a packet assembly output for delivering data packets to another computer;

a packet broadcast input for receiving data packets; and

an interface connected to the packet assembly input, the packet assembly output, and the packet broadcast input, the interface for:

merging data packets received at the packet assembly input with data packets

generated by the computer into a merged stream of data packets;

delivering the merged stream of data packets to the packet assembly output;

detecting data packets from the packet broadcast input which are addressed to the computer; and

delivering the detected packets to the computer;

a packet assembly channel for assembling data packets generated by the computers and connecting the computers in a sequential chain with a first computer and a last computer via the packet assembly output of the computers, except the last computer, and the packet assembly input of the next computer in sequence through a packet communication connection; and

a packet broadcast channel including a packet communication connection between the packet assembly output of the last computer and the packet broadcast inputs of the computers.

6. An interface for a computer in a network having separate packet assembly and packet broadcast channels, the computer having an address and for generating addressed data packets, the interface comprising:

a packet assembly input for receiving addressed data packets from another computer on the packet assembly channel;

a packet assembly output for transmitting addressed data packets to another computer on the packet assembly channel;

a packet broadcast input for receiving addressed data packets from the network on the packet broadcast channel; and

an interface connected to the packet assembly input, the packet assembly output, and the packet broadcast input, the interface for:

merging addressed data packets received at the packet assembly input with addressed

data packets generated by the computer into a stream of addressed data packets;

transmitting the stream of addressed data packets to the packet assembly output;

detecting addressed data packets from the packet broadcast input which are addressed to the computer; and

transmitting the detected data packets to the computer.

7. A hub for a network including computers and communication media, the computers having addresses and for generating data packets, the communication media including a packet reception channel and a packet broadcast channel, the hub comprising:

a sequential interface for sequentially routing data packets through the computers to a last computer via the packet reception channel, the sequential interface including:

a plurality of inputs for receiving data packets from the packet reception channel; and

a plurality of outputs for providing data packets to the packet reception channel; and

a broadcast interface for broadcasting data packets to the computers via the packet broadcast channel, the broadcast interface including a broadcast output connected to the sequential interface for receiving data packets which have been sequentially routed through the last computer and for providing data packets received thereby to the packet broadcast channel.

**8.** A network comprising:

communication media including a reception medium and a delivery medium;

a plurality of computers connected in a chain including a first computer and a last

computer such that the computers except the first computer communicate with a preceding computer and the computer except the last computer communicate with a following computer via the reception medium; and

a plurality of network interface cards for respectively connecting the computers to the communication media;

the reception medium sequentially routing data from a computer through the network interface cards of the following computers;

the delivery medium receiving from the reception medium data sequentially routed through the network interface card connected to last computer

each network interface card including:

a local input connected to and for receiving data generated by a computer;

a remote input connected to the reception medium for receiving data from a preceding computer;

a remote output connected to the local input, to the remote input, and to the reception medium, the remote output for providing data received at the local and remote inputs to the reception medium;

a broadcast input connected to the delivery medium for receiving data sequentially routed through the network interface card connected to the last computer; and

a local output connected to the broadcast input for providing data received at the broadcast input to the computer.

**9.** An interface for connecting a computer to communication media in a network, the communication media including a reception medium and a delivery medium, the network including computers sequentially connected via the reception medium in a chain with a first computer and a last computer, the interface comprising:

a local input for connecting to and receiving data generated by a computer;

a remote input for connecting to the reception medium and for receiving data generated by a preceding computer;

a remote output connected to the local input and to the remote input for providing data received at the local and remote inputs to the reception medium for delivery to the remote input of the network interface card connected to a subsequent computer;

a broadcast input for connecting to the delivery medium and for receiving data generated by any of the computers and provided by the remote output of the network interface card connected to the last computer; and

a local output connected to the broadcast input for connecting to and providing data received at the broadcast input to the computer.

**10.** A method for communicating data in a network including stations connected in a chain with a last station, the method comprising:

sequentially routing data from a station to the last station;

broadcasting data sequentially routed to the last station to the stations.

**11.** The method of claim **9** further comprising the step of:

broadcasting data from a remote station not connected in the chain to the stations.

**12.** A network comprising:

a plurality of computers:

each having an address;

for generating addressed data packets; and

including an interface with a data output and a broadcast input;

a plurality of data channels respectively connected to the data outputs of the computers for receiving addressed data packets;

a broadcast channel connected to the broadcast inputs of the computers; and

a network hub including:

a plurality of ports respectively connected to the data channels; and

a broadcast output connected to the broadcast channel;

the network hub for sequentially merging addressed data packets received at the ports into a stream of data packets and for providing the stream of data packets to the broadcast channel.

**13.** A hub for a network including computers for generating data packets and connected by reception media and delivery media, the hub comprising:

a plurality of ports for connecting to the reception media and for receiving via the reception media data packets from a computer;

a plurality of storage devices respectively connected to the ports for receiving and storing data packets from a computer;

a processor connected to the storage devices for sequentially merging stored data packets into a stream of data packets;

a broadcast output for connecting to the delivery media and for providing the stream of data packets to the delivery media for delivery to the computers; and

an internal bus connected to the storage devices and the broadcast output for delivering the stream of data packets to the broadcast output.

**14.** A method for communicating data packets in a network including computers connected to a hub by a delivery channel and a broadcast channel, the method comprising:

generating data packets by the computers;

transmitting the data packets to the hub via the delivery channel;

receiving the data packets at the network hub;

merging the data packets into a stream of data packets; and

broadcasting the stream of data packets to computers via the broadcast channel.

**15.** The method of claim 14 further comprising storing the data packets prior to merging the data packets.

**16.** The method of claim 14 further comprising amplifying the stream of data packets prior to broadcasting.

**17.** The method of claim 14 further comprising:

receiving a remote stream of data packets at the hub via another delivery channel; and

broadcasting the remote stream of data packets to the computers via another broadcast channel.

**18.** The method of claim 14 further comprising transmitting the stream of data packets to another hub.

**19.** The method of claim 14 further comprising:

receiving a remote stream of data packets at the hub via another delivery channel;

merging the remote stream of data packets with the stream of data packets; and

broadcasting the merged stream of data packets to the computers via the broadcast channel.

**20.** A network comprising:

a packet-merging channel;

a plurality of computers for generating addressed data packets and including an interface with a data output and a broadcast input;

a plurality of storage devices:

connected to the packet-merging channel;

connected to the data outputs of the computers, respectively;

for receiving addressed data packets generated by the computer;

for storing the addressed data packets; and

for merging the addressed data packets into a stream of data packets on the packet-merging channel; and

a broadcast channel:

connected to the broadcast inputs of the computers;

for receiving the stream of data packets from the packet-merging channel; and

for delivering to the computers the stream of data packets.

**21.** A network comprising:

a plurality of computers each having an address, for generating data packets, and including an interface with a port;

a plurality of two-way data channels respectively connected to the ports of the computers for receiving data packets; and

a network hub including:

a plurality of ports respectively connected to the data channels for receiving data

packets;

a processor for merging data packets received at the ports into a stream of data packets and for providing the stream of data packets to the data channels for delivery to the computers; and

a plurality of storage devices respectively connected to the ports for receiving data packets and for storing data packets from the port connected thereto when the processor is merging data packets from another one of the ports into the stream of data packets.

22. A hub for connecting computers and communication media in a network, the computers for generating data packets, the network hub comprising:

a plurality of ports for connecting to the communication media and for respectively receiving data packets from a computer;

a plurality of storage devices respectively connected to the ports for receiving and storing data packets from the computer associated therewith;

an internal bus connected to the storage devices and the communication media; and

a processor for merging data packets stored by the storage devices into a stream of data packets on the internal bus and for providing the stream of data packets to the communication media for delivery to the computers.

23. An interface for a computer in a network, the computer for generating data packets and communicating via a packet assembly channel with other computers in the network, the interface comprising:

a local input for receiving local data packets;

a remote input for receiving remote data packets from another computer;

a remote output for providing local and remote data packets to the packet assembly channel;

a processor for transmitting local and remote data packets from the inputs to the remote output;

a local storage device for receiving local data packets from the local input and providing local data packets to the processor; and

a remote storage device for receiving remote data packets from the remote input and

providing remote data packets to the processor;

the local storage device for storing local data packets received from the local input when the processor is receiving remote data packets from the remote storage device; and

the remote storage device for storing remote data packets received from the remote input when the processor is transmitting local data packets to the remote output.

**24.** A method for operating a network interface card in a network including a plurality of computers, the network interface card for connecting to a local computer to receive local data, for receiving remote data from a remote computer, and for transmitting the local and remote data to another computer, the method comprising:

storing local data when remote data is being transmitted;

transmitting the stored local data;

storing remote data when local data is being transmitted; and

transmitting the stored remote data.

**25.** The method of claim **24** wherein:

the step of transmitting the stored local data includes releasing local data packets and transmitting released local data packets; and

the step of transmitting the stored remote data includes releasing stored remote data packets when released local data packets have been transmitted.